WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE
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Washington, D. C. No. 7 December, 1936

Biological Survey: Annual Report, 1935-1936

Gabrielson, Ira N. Report of the Chief of the Bureau of Biological Survey, 1936 (Biological Survey, Washington, D. C.), 68 pp., December 1936.

The usual annual summary, nearly 30 pages of which are devoted to an account of refuges and the refuge program of the Survey. At the end of the year, refuges under administration numbered 164, totalling over nine million acres, and 50 additional were in process of establishment. Practically the entire content of the report is of interest to wildlife managers, but of special pertinence may be mentioned the account of progress made in establishing cooperative research and demonstration units in wildlife management, reports on various food habit investigations, research on diseases of wildlife, life histories of fur animals, the status of waterfowl, and upon forest and range faunas.

Classification: Deer of the Pacific Slope

Cowan, Ian McT. Distribution and variation in deer (Genus Odocoileus) of the Pacific Coastal Region of North America, Calif. Fish and Game (450 McAllister St., San Francisco, Calif., 25 cents a copy), 22(3), July 1936, pp. 155-246, figs. 51-63, 3 graphs, 8 tables.

Variations are discussed as they are correlated with sex, age, individuality, and geographic origin. Pelage and molts, skin glands, antlers, and teeth are described in relation to classification. A key to the adult males of 11 forms is presented as well as systematic accounts of the subspecies embracing synonymy, range, coloration, cranial and antler details, and comparative discussion. Bibliography of 152 titles. A detailed and comprehensive report evidently of high quality.

Conservation: Crow question

Lumley, Ellsworth D. The crow as a "villain", Nature Magazine (1214 Sixteenth St., N. W., Washington, D. C., 35 cents a copy), 28(6), Dec. 1936 (Nov.), pp. 366-367, 1 photo.

Reduction in shooting seasons and bag limits stimulated ammunition manufacturers and sporting magazines to urge crow shooting for business reasons. Anti-crow propaganda described (and references given), including efforts to establish crow shooting as a sport and to popularize crows as food. "If the time, money, and energy expended in crow killing campaigns were spent in projects based upon the findings of science and research, real conservation would be accomplished. It will be necessary for men to think, reason, and abide by the findings of wildlife authorities, rather than to accept as true the propaganda spread by selfish concerns, if wildlife conservation is to advance."

Conservation: In national parks

Anon. Predators in the national parks, Parks and Recreation (327 W. Jefferson St., Rockford, Ill., 25 cents a copy), 20(1), Sept. 1936, pp. 37-41, 3 photos.

Notes on estimable qualities of predatory animals. "The National Park Service believes in conserving all animals within the park system, whether they be predators or those animals that are more popular with the public."

Conservation: In Pennsylvania

Luttringer, Leo A., Jr. Game returns to the land of William Penn, American Forests (919 Seventeenth St., N. W., Washington, D. C., 35 cents a copy), 42(9), Sept. 1936, pp. 403-407, 437, 10 photos.

History of the Pennsylvania Board of Game Commissioners, the protective laws, and the refuge system of the State. There are 132 primary refuges totalling 109,517 acres, and auxiliary refuges comprising 23,506 acres. They serve State hunting lands amounting to 507,406 acres. "Refuge keepers destroy all the predatory creatures that they can." Over $100,000 is spent annually in bounties for wildcats, gray foxes, weasels, and goshawks. In 1935 State game farms shipped for restocking purposes 45,398 ring-necked pheasants, 9,181 bobwhites, 3,593 wild turkeys, and 833 wild ducks. In addition over 77,000 cottontails were purchased and released. The annual value of game is estimated at $6,000,000, fur $2,000,000, and expenditures by hunters, $10,000,000.

Conservation: Policies, Wildlife Institute

Anon. Wildlife for the future, American Wildlife Institute (Investment Bldg., Washington, D. C.), 24 pp. copiously illustrated with photographs, Nov. 1936.

A statement of the Institute's aims and an appeal for cooperation. Briefly recites the damage done by pollution, drainage, fire, overgrazing, and other destructive factors. The Institute is designed to work with other organizations, and not to compete with them. Account of the cooperative demonstration projects at land grant colleges and of plans for other researches. Of special interest to the wildlife management group are labelled photographs of Aldo Leopold, Herbert L. Stoddard, Gardiner Bump, Carl L. Hubbs, and George C. Embody. "American Wildlife", the Institute's official magazine, said to be "the only publication devoting most of its attention to wildlife management."

Control: Aquatic birds

McAtee, W. L., and S. E. Piper. Excluding birds from reservoirs and fish ponds, U. S. Dept. Agr. Leaflet (Superintendent of Documents, Washington, D. C., 5 cents a copy) 120, 6 pp., 3 figs., Oct. 1936.

This is a contribution to preventive, as opposed to punitive, methods of control. Wide-spaced wiring to deter birds from alighting on water supply reservoirs, and closer screening to protect small fish ponds are recommended and described.

Control: From a conservationist's view point

Vorhies, Charles T. Rodents and conservation, Nature Magazine (1214 Sixteenth St., N. W., Washington, D. C., 35 cents a copy), 28(6), Dec. 1936 (Nov.), pp. 363-365, 379, 4 photos.

Criticism of the course of Federal agencies in the conservation field in the past four years. Rodent control ignores beneficial activities of the animals. Jack rabbits and wood rats are "animal weeds" on the range and are an effect, rather than a cause, of overgrazing. The range is not worth what is spent on it for rodent control; on a large area near Tucson, Arizona, the cost was 19 cents per acre, but cattlemen pay only 4 cents per acre for the grazing. To remove the number of jack rabbits that would consume as much forage as one cow cost, in the case of the antelope jack rabbit $23.68, and in that of the California jack rabbit $47.36; "the livestock was worth possibly $20 to $25 per head." Reduction in livestock is what is needed to restore the range; areas protected from stock come back regardless of their rodent population. The elimination of rodents will have a serious effect upon carnivorous fur bearers. The use of C.C.C. workers in control campaigns is deplored.

Control: Protecting trees from deer

Mills, E. M. Protecting trees from deer, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 7(6), Sept. 1936, pp. 20-21, 6 illus.

Deer show a distinct preference for cultivated plants. Kinds of trees and other crops damaged and nature of the injury. 87 two-year-old trees destroyed in three nights by one deer; 175 destroyed in one night by six deer. Unsuccessful deterrents were rags hung on the trees, sprays, and fences not prohibitive in cost. Successful protectants included asafoetida, naphthalene, tar-paper cones, and automatic flash guns. Trapping of possible value but laborious and expensive.

Control: Rats

Hamilton, W. J., Jr. Rats and their control, Cornell University Agr. Expt. Sta. (Ithaca, N. Y.) Extension Bul. 353, 32 pp., 11 figs., June 1936.

Injurious tendencies of the rat described, and life history briefed; control measures treated under the heads of poisoning, gassing, imprisoning and clubbing, trapping, use of dogs, and miscellaneous methods. Rat-proofing, rat campaigns, and natural enemies also are discussed.

Control: The "vermin" problem

Key, Louis A. Where are we headed with vermin control?, Ohio Outdoor News (210 N. Court St., Circleville, Ohio, 5 cents a copy), 2(5), Nov. 1936, p. 2.

After a decade of indiscriminate slaughter of "vermin", can any man point out any gain in the Ohio small game supply? The game situation is more precarious than ever before in the history of the State and man is responsible. There is no necessity for hunting and it must be restricted.

Cycles: Blue jay

Snyder, L. L., and T. M. Shortt. 1933, a "Blue Jay Year", Canadian Field Nat. (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada, 25 cents a copy), 50(7), Oct. 1936, p. 118.

Unusual numbers bring up the question as to whether the blue jay population fluctuates periodically.

Cycles: Hungarian partridge

Rowan, William. The partridge situation in western Canada, The Sportsman (10 Ferry St., Concord, N. H., 50 cents a copy), 20(3), Sept. 1936, pp. 43, 63, 1 fig.

From plantings made in 1908 and 1909 the birds have spread "nearly a thousand miles east and five hundred northward." The author believes the species has joined the group of cyclically fluctuating birds and mammals of the region, a matter, as he says, "of exceptional biological interest."

Cycles: Ruffed grouse

Clarke, C. H. Douglas. Fluctuations in numbers of ruffed grouse, Bonasa umbellus (Linne), with special reference to Ontario, University of Toronto Studies (University of Toronto Press, Toronto, Canada, $1.00 a copy), 41, 118 pp., 15 figs., 11 tables.

Reviews the literature of the subject, and describes methods employed in his investigation. The fluctuations in population are not strictly regular

and do not occur simultaneously throughout the province of Ontario. The diminution took the form of a dying-off from disease, probably due to Leucocytozoon bonasae affecting chiefly young grouse and taking place in the summer. A total of 17 species of animal parasites are known to affect ruffed grouse; mycosis also is reported. Among other findings of interest is that general size of grouse territories was from 3 to 10 acres, and the minimum apparently 2 acres. Ruffed grouse do not inhabit: (1) Unbroken forest of any type; (2) grazed woodlots; (3) purely coniferous woods; (4) areas of solid brush without trees or open spaces; and (5) brules where the second growth poplar or conifers had not yet reached about twenty feet in height, unless a considerable residue of the original forest is left. Bibliography of 217 titles

Cycles: Snowshoe hare

Lloyd, Hoyes. The late Norman Criddle's record of the snowshoe rabbit (Lepus americanus) at Aweme, Manitoba, Canadian Field Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada, 25 cents a copy), 50(8), Nov. 1936, pp. 129-130, 1 graph.

A record of abundance extending over 35 years expressed in a curve in which the high points are for 1905, 1913-4, and 1921-3.

Cycles: Solar in relation to biological

MacLulich, D. A. Sunspots and abundance of animals, Journ. Royal Astronomical Soc. Canada (J. H. Horning, 198 College St., Toronto, Canada, 25 cents a copy), 30(6), July-Aug. 1936, pp. 233-246, 2 graphs.

The author briefly reviews much of the previous literature and points out various factors of error. He brings out that phenomena which show fair correlation over a short period may fail to do so over a notably longer one. Including all of the data available, and eliminating all errors, so far as possible, the author demonstrates that the lynx and rabbit cycles as shown by fur returns are not correlated with periods of sunspot abundance. The average length of the cycles were 9.7 years for the lynx, and 11.1 for the sunspots; and figured on a somewhat different series of years, 9.6 years for the rabbit cycle and 11.0 for the sunspots. While fluctuations in numbers of the animals are not correlated with sunspots they are strongly correlated with each other. Bibliography of 41 titles.

Cycles: Sun rhythms

Abbot, C. G. The influence of solar variability on weather, Sci. Monthly (Lancaster, Pa., 50 cents a copy), Aug. 1936, pp. 108-121, 14 figs.

About the same material as was abstracted in WILDLIFE REVIEW, No. 1, Sept. 1935, pp. 3-4.

Destruction: By hunting

Chambers, W. Lee. The hunter in southern California versus wild animal life, The Condor (2068 Escarpa Drive, Eagle Rock, Calif., 50 cents a copy), 38(5), pp. 199-202.

The author has been in the sporting goods business for 40 years; he comments on development in the efficiency of firearms, the use of almost all living creatures for targets, and the effects upon wildlife. He ends by saying "I firmly believe that the future of birdlife in this territory is doomed unless something is done to stop the tremendous slaughter by target, or practice, shooting. Large sanctuaries offer the only positive protection, and outside them everything larger than a sparrow is destined for destruction."

Destruction: Of mammals

Edge, Rosalie. Finishing the mammals, Emergency Conservation Committee Publications (734 Lexington Ave., New York, N. Y., no charge), 7, 1936, 24 pp., illus., 1 table.

Destruction of mammals below the size of "big game" by trapping and hunting, in "vermin" and control campaigns, and for bounties. A powerful indictment of man's destructiveness.

Destruction: Passenger pigeon

Mitchell, Margaret H. The passenger pigeon in Ontario, Contributions Royal Ontario Mus. Zool. (Toronto, Canada, $1.00 paper, $1.50 cloth), 7, 1935, 181 pp., illus.

An exhaustive account of much broader geographic scope than indicated by the title. Of interest in our work, chiefly as showing how a species of apparently limitless abundance was steadily and relentlessly destroyed by man.

Disease

Brigham, Geo. D. Susceptibility of the opossum (Didelphis virginiana) to the virus of endemic typhus fever, U. S. Public Health Reports (Superintendent of Documents, Washington, D. C., 5 cents a copy), 51(13), March 1936, pp. 333-337, 4 figs., 1 table.

The studies here reported indicate that the opossum is susceptible to the virus of endemic typhus fever (adapted from Experiment Station Record 75(3), Sept. 1936, p. 373).

Disease

Brigham, Geo. D. A strain of endemic typhus fever isolated from the brain of a wild rat, U. S. Public Health Reports (Superintendent of Documents, Washington, D. C., 5 cents a copy), 51(13), March 1936, pp. 337-339.

From Rattus norvegicus trapped in Montgomery, Ala. (adapted from Experiment Station Record, 75(3), Sept. 1936, p. 399).

Disease

Elton, Charles, D. H. S. Davis, and G. M. Findlay. Journ. Animal Ecology (Cambridge University Press, Fetter Lane, London, E. C. 4, England), 4(2), Nov. 1935, pp. 277-288, pl. 9, 4 tables.

Author's summary: "On the basis of trapping and trace censuses an epidemic among voles (Microtus) was forecast in the Newcastleton area of southern Scotland for the spring of 1934. This was expected as the result of a periodic maximum in numbers shown in 1933. Field and laboratory studies were carried out during the first 6 months of 1934, involving census work, breeding voles, collection of live voles and pathological examinations and experiments. A severe epidemic occurred with a peak mortality in April and May, voles dying in the laboratory with a protozoan infection of the brain due to Toxoplasma. This was successfully transmitted to stocks of normal healthy voles and no deaths were found due to causes other than Toxoplasma. Since Toxoplasma was found to cause similar mortality on two other areas in 1933 it is evidently an important controlling factor in the short-period fluctuation known to occur among vole populations in Britain."

Disease

Green, R. G., J. E. Shillinger, and Carl L. Larson. Minnesota Wildlife Disease Investigation (obtainable from Dr. J. E. Shillinger, Biological Survey, Washington, D. C.), June 1936, pp. 181-198, tables 110-114.

Continuation of report on Shock Disease of snowshoe hares (see WILDLIFE REVIEW, No. 5, Sept. 1936, p. 9) giving an account of the gross and microscopica pathology. The section on Lake Alexander Investigation contains notes on tularemia, tick infestation, pathological reports on trapped and captive hares, and on autopsies of miscellaneous mammals and one bird.

Disease

Morley, L. C., and P. W. Wetmore. The etiology of ulcerative enteritis in upland game birds, Science (Lancaster, Pa., 15 cents a copy), 84(2177), Sept. 18, 1936, pp. 272-273.

Ulcerative enteritis or "quail disease" usually resulting from overcrowding is a highly infectious and rapidly fatal disease that affects most species of native upland game birds. Description of lesions of the disease; diagnosis may be made by feeding infective material to test birds. The causative organism has been isolated and is described as Corynebacterium perdicum, new species.

Disease

Shaw, R. M., and Gretta S. Simpson. Clostridium botulinum Type C in relation to duck sickness in the Province of Alberta, Journ. Bacteriol. (Williams & Wilkins Co., Baltimore, Md.), 32(1), July 1936, pp. 79-88, 3 tables.

A severe epidemic among wild ducks occurring in southern Alberta in the summer of 1933 was identified as botulism. Bacterial cultures were made from tissues of dead ducks; their morphology and culture reactions are described. Experiments to determine toxicity to pigeons are set forth; large doses of strong toxin killed birds within two hours after the first observed symptom. It was found possible to protect pigeons against botulism by the use of antitoxins.

Disease: Parasites

Brandt, B. B. Parasites of certain North Carolina Salientia, Ecological Monographs (Duke University Press, Durham, N. C.), 6(4), pp. 491-532, 15 tables.

The parasites of the bullfrog, at least, may be of direct, while those of other frogs and toads may have indirect, interest for the wildlife manager. This treatment describes methods of study, and discusses the occurrence of parasites by species and by ecological groups of hosts, and comments on variation in parasitism as related to seasons, and size and age of hosts. The total number of species of parasites reported from the bullfrog is 35. There is an extensive bibliography.

Disease: Parasites

Chandler, Asa C. The genus Schizotaenia in porcupines, Journ. Parasitology (Science Press, Lancaster, Pa.), 22(5), Oct. 1936, p. 513.

Occurrence of two species of this genus in American porcupines.

Disease: Parasites

Harkema, Reinard. The parasites of some North Carolina rodents, Ecological Monographs (Duke University Press, Durham, N. C., $1.50 a copy), 6(2), April 1936, pp. 153-232.

General review of work on rodent parasites. Description of methods, and of numbers of species and specimens used in this study. Parasites are listed according to hosts, the maximum number of kinds - 13 - being recorded for both the brown rat and cottontail. There is also a list of the parasites reported from North American Rodentia and Lagomorpha and an extensive bibliography.

Disease: Parasites

Roudabush, Robert L. Arthropod and helminth parasites of the American bison (Bison bison), Journ. Parasitology (Science Press, Lancaster, Pa.), 22(5), Oct. 1936, pp. 517-518.

Record of ticks, warbles, and internal parasites from 13 bisons slaughtered on the Wichita National Game Preserve, Oklahoma.

Disease: Parasites

Warwick, Tom. The parasites of the muskrat (Ondatra zibethica L.) in the British Isles, Parasitology (Cambridge University Press, Fetter Lane, E. C. 4, London, England), 28(3), July 1936, pp. 395-402, 3 tables.

This study revealed 5 helminths, two of which were introduced with the muskrat; three common ectoparasites also from North America, and three of rare occurrence from the British fauna. "Introduction into Britain has greatly depleted the original helminth fauna as regards number of species and individuals; but not so with the ectoparasites."

Ecology

Gordon, Robert B. A preliminary vegetation map of Indiana, Amer. Midland Nat. (University Press, Notre Dame, Ind.), 17(5), Sept. 1936, pp. 866-877, 3 pls., 1 folded map.

Descriptions and map showing, in black and white, approximate distribution of 8 major types of vegetation. The author urges detailed county surveys and says, "These will be of tremendous practical importance in land utilization and in wild life management projects." There is a bibliography of 26 titles.

Ecology

Taylor, Walter P. Some effects of animals on plants, Sci. Monthly (Lancaster, Pa., 50 cents a copy), Sept. 1936, pp. 262-271.

A plea for the scientific management of wildlife in the light of all the facts. Discussion of grass feeders and the part they play on overgrazed ranges; the effects of animal feeding on plants other than grasses; the role of animals in cross-fertilization of plants; and summary of the effects of animals on plants, including a systematic outline of the subject.

Ecology

Williams, Arthur B. The composition and dynamics of a beech-maple climax community, Sci. Publ. Cleveland Mus. Nat. Hist. (Cleveland, Ohio), 6, July 1936, 92 pp., 16 figs., 23 tables. First printed in Ecological Monographs 6(3), July 1936, pp. 317-408 (Duke University Press, Durham, N. C.).

A thorough study of a 65 acre tract, the most interesting results of which for conservation biologists are those relating to wildlife populations. In four years mammals were found to vary in number from 109 to 529 per acre and nesting birds from 2 to 2.7 pairs (4 to 5.4 individuals) per acre. Such figures again suggest the great but comparatively neglected economic role of mammals in comparison with birds. Fluctuations in populations are described and discussed. Bibliography of 65 titles.

Ecology: Bird numbers

Hardy, Eric. Bird life on the farm, Discovery (Bouverie House, Fleet St., London, E. C. 4, England, 1 shilling (25 cents) a copy), 17(201), Sept. 1936, pp. 290-291.

Of interest for comparison with American figures. "The resident summer bird population of the 56,323,366 acres of Britain worked out at about 200,000,000." This is at the rate of 3.55 birds per acre. "The house-sparrow is the most numerous bird, both in town and country." "Land where game birds are reared has a more concentrated and varied wild bird population than land without game." The writer's statement that artificial manures decrease insect populations does not agree with the findings of the Imperial Chemical Industries. (Advisory Leaflet No. 7, Jan. 1935, abstracted in WILDLIFE REVIEW, No. 3, April 1936, p. 27.)

Ecology: Mink

Marshall, William K. A study of the winter activities of the mink, Journ. Mamm. (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(4), Nov. 1936, pp. 382-392, 2 pls., 1 fig., 3 tables.

Field identification of sexes possible because of different sizes of tracks; notes on extent of winter movements, use of dens, routine, effect of temperature on activity, mating behavior, and cover type preferences. The winter territory of the female tends to be restricted to an area of approximately 20 acres; that of males is more extensive. Directions for a census of minks are given. In the area studied (southern Michigan) there was a population of 1.5 females per section. Bibliography of 11 titles.

Ecology: Mole

Arlton, A. V. An ecological study of the mole, Journ. Mamm. (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(4), Nov. 1936, pp. 349-371, 5 figs., 2 tables.

Comprehensive report on habitat, community relations, behavior, structure and adaptations, and economic status. Localities, Iowa and Nebraska. Concludes that moles are beneficial in fields and should not be destroyed. Bibliography of 27 titles.

Ecology: Mosquito control operations

Cahalan, John I. Mosquito control vs. wildlife in Delaware. Affirmative. Delaware Sportsman (Box 872, Wilmington, Del., 25 cents a copy), 2(2), Oct. 1936, p. 8.

One side of the published version of a debate at a meeting in Dover, Del., Oct. 6, 1936; for the other see Vogt, below. The affirmative stresses the necessity of mosquito control from a public comfort and health standpoint; claims improvement in marsh conditions through control of water levels with resulting benefit to muskrat farming; denies that the growth of wigeongrass is adversely affected; and cites various financial gains to the State due to mosquito control operations.

Ecology: Mosquito control operations

Vogt, William. Mosquito control vs. wildlife in Delaware. Negative. Delaware Sportsman (Box 872, Wilmington, Del., 25 cents a copy), 2(2), Oct. 1936, pp. 9, 11, 2 photos.

Part of a debate; see also Cahalan above. Wildlife food supply diminishe by marsh drainage; useful, being supplanted by useless, plants. Some marshes ditched and their ecology changed, yet remain mosquito breeding areas. Claims that wigeongrass and sago pondweed are destroyed in ponds by ditching, and that the muskrat industry is damaged by mosquito control operations.

Ecology: Number of toads

MacLulich, D. A. Census of American toads, Bufo americanus, Copeia (Museum of Zoology, University of Michigan, Ann Arbor, Mich., 75 cents a copy), 1935(4), December, p. 181.

One summer's observations on seven quarter-acre tracts in an Ontario white pine forest indicated a population of about 7 toads to the acre.

Ecology: Opossum

Yeager, Lee E. Winter daytime dens of opossums, Journ. Mammalogy (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(4), Nov. 1936, pp. 410-411, 2 tables.

Percentage in trees (16.7), logs (30.5), etc., details as to height level (whether under or above ground), and type of habitat in which dens were located. Mississippi.

Ecology: Photoperiodism

Bissonnette, T. H. Sexual photoperiodicity, Journ. Heredity (1918-32 Harford Ave., Baltimore, Md., 35 cents a copy), 27(5), May 1936, pp. 171-180, 4 figs.

The subject according to the subtitle of this article is the "influence of varying quantities and qualities of light on sexual activity in plants and animals an example of the interaction of genetic and environmental factors in conditioning the expression of characters." It is difficult to summarize a paper which itself is essentially a summary of existing knowledge for its field. The author is one of the leading students of the subject and eminently capable of pointing out the significant findings embodied in the literature, 105 titles of which are cited in the terminal bibliography.

Ecology: Rodents in grassland

Phillips, Paul. The distribution of rodents in overgrazed and normal grasslands of central Oklahoma, Ecology (Prince and Lemon Sts., Lancaster, Pa., $1.25 a copy), 17(4), Oct. 1936, pp. 673-679, 1 fig., 1 table.

Author's summary: "Comparative data were obtained on the distribution of various common rodents and lagomorphs in grasslands of Central Oklahoma. Pellet counts indicated that jack rabbits were most abundant in moderately overgrazed areas and cottontails preferred the cover afforded by undisturbed grasslands. Mound counts showed pocket gophers more numerous in mowed hayfields and moderately overgrazed pastures than in either heavily or overgrazed or undisturbed areas. Ground squirrels occurred more often in mowed hayfields. Trapping showed that deer-mice were most numerous in moderately overgrazed grassland while cotton rats were almost entirely restricted to heavily grassed undisturbed areas." Abstracter's comment: The findings of this paper indicate that the animals studied are largely controlled in their distribution by overgrazing which they do not originate. There is an interesting bibliography of 17 titles.

Ecology: Rodents in relation to erosion

Renner, F. G. Conditions influencing erosion on the Boise River watershed, U. S. Dept. Agr. Tech. Bul. (Superintendent of Documents, Washington, D. C., 5 cents a copy) 528, 32 pp., 14 figs., 11 tables, Oct. 1936 (December).

Rodent infestation is discussed on pages 22-24. While overgrazing and compacting of the soil by stock are recognized as the primary cause, "Rodents appear to have been an important factor contributing to the accelerated erosion. These animals have partially depleted the vegetation and disturbed the soil over four-fifths of the area studied. In addition, their effect upon erosion has probably been increased by their habits of concentration on southerly exposures and other areas which are heavily grazed by livestock." However, "The erosion was found to vary directly with the degree to which the vegetation cover has been depleted and the surface conditions disturbed by the grazing of livestock. Almost without exception, the areas which have been grazed most heavily are examples of the most severe erosion." (p. 32.) The case seems allied to that of the so-called "vermin" as in neither would the animals concerned have been regarded as destructive, had they not been forced into that position by becoming accessory to the overwhelming destructiveness of man and his works.

Ecology: Sampling insect populations

Carpenter, J. Richard, and John Ford. The use of sweep net samples in an ecological survey, Journ. Soc. for British Entomology (University Museum, Oxford, England), 1, Aug. 1936, pp. 155-161, figs. 11-12, 3 tables.

The possible utility to the wildlife manager of a simple method of sampling insect populations was mentioned in WILDLIFE REVIEW, No. 1, Sept. 1935, p. 32. The paper here cited is an experimental and statistical study of the subject which indicates that a considerable number (75) of sweeps may be necessary for accuracy in securing representative samples. On the other hand the wildlife manager does not require a high degree of accuracy so the former recommendation of from 6 to 9 sweeps, each travelling through about 8 feet of the vegetation, may be depended upon to give a sufficiently good indication of the insect population.

Ecology: Wildlife survey

Taylor, Walter P. A national wildlife survey, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(5), Sept.-Oct. 1936, pp. 69, 77.

Land-planning rests on land classification for which full information is needed in order that each tract may be devoted to its highest use. Knowledge of the distribution and abundance of wildlife is very superficial and a thorough and continuing biological survey by adequately trained personnel is requisite.

Economics

Hoover, Earl E. New Hampshire's game resources, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(4), July-Aug. 1936, pp. 51, 58, 60, 2 figs., 4 tables.

"Almost $6,000,000 is spent in New Hampshire each year by hunters and fishermen x x x Ninety-seven percent of the total expenditure is distributed among private business interests." The directions in which those funds are spent are analyzed both for resident and non-resident sportsmen. The data used were obtained from replies to a questionnaire sent to every tenth license holder.

Education

Bode, I. T. Cooperative units showing results, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(4), July-Aug. 1936, pp. 56, 61-63, 4 photos.

A summary of plans and accomplishments to date of wildlife research and demonstration projects established at land grant colleges in nine States.

Education

Ingles, Lloyd G. Small wild mammals of California, California State Dept. of Education Science Guide for Elementary Schools (Sacramento, Calif., 15 cents a copy), 3(1), Aug. 1936, 44 pp., 17 figs.

Simple key to genera; popular account of representative species; small mammals and conservation; a suggested curriculum; useful references.

Education

Reid, D. H. An elective course in game conservation and management at A. & M. College, College Station, Texas, Poultry Science (450 Ahnaip St., Menasha, Wis., 75 cents a copy), 15(3), May 1936, pp. 223-224.

Popular account of the conduct of the course including study of means of recognition of important species, of past and present abundance of wildlife and the governing factors, inspection of management operations on farms, study of food habits and diseases of wildlife, of hunting practices, farmer-sportsman relationships, and legal protection. The course covered fishes as well as land vertebrates.

Education: Alabama Cooperative Wildlife Research and Demonstration Project

Peters, Harold S. Wildlife Research Station reports on four game projects, Ala. Game and Fish News (Dept. of Conservation, Montgomery, Ala., 10 cents a copy), 8(6), December 1936, pp. 4-5, 13-15.

Report of progress during first 10 months, on projects devoted to the mourning dove, bobwhite, white-tailed deer, and waterfowl.

Farmer-sportsman relationship

Morton, James N. The sportsman and the landowner, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(7), Oct. 1936, pp. 2-3, 2 photos.

Discussion of this vexed problem by one who is experienced in both sides of it.

Food Habits: Dew as a water supply

Dalke, Paul D. Water for pheasants, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(5), Sept.-Oct. 1936, p. 70, 1 photo.

In southern Michigan dew is available for a few hours after sunrise on many summer days. The amount in quarts per acre varies from 3 to 25 or more, according to the abundance of the condensed moisture. Notes are given on the dew retaining qualities of various plants.

Food Habits: Grouse

Schmidt, F. J. W. Winter food of the sharp-tailed grouse and pinnated grouse in Wisconsin, Wilson Bul. (Dr. T. C. Stephens, Sioux City, Iowa, 60 cents a copy), 48(3), Sept. 1936, pp. 186-203, 3 figs., 1 table.

The condensed and informative quality of this report indicates what a great loss conservation biology has suffered in the tragic death of its author, Aug. 7, 1935, in a fire that consumed also his accumulated notes, photographs, and manuscripts. In this report are presented worth while notes from the literature but chiefly the results of obviously exact and thorough field investigations of the author. They relate to all classes of food which are ranked in value, and compared as to utility, for 4 kinds of American grouse and the red grouse of Great Britain. Suggestions are made as to artificial feeding and other food management practices and a table given showing the palatability sequence of winter foods for the prairie sharp-tailed, the northern sharp-tailed, the pinnated, and the ruffed grouse.

Food Habits: Hawks

Poole, Earle L. Enter hawk - exit mouse, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(7), Oct. 1936, pp. 17, 25, 27, 2 illus. by author.

A watershed on which no hunting was permitted developed an abundance of wildlife. Birds of prey were numerous, yet hundreds of pheasants and thousands of rabbits were trapped for distribution elsewhere. A game trapper took it upon himself to shoot as many of the hawks as possible. These were rough-legs and their stomachs contained meadow mice, exclusively. Previous studies had shown the food of other hawks and owls on this area to consist of meadow mice to the proportion of about 95 percent. Damage to trees by mice convinced the head of the water bureau that more, not fewer, hawks were needed on the area and orders were given that no more shooting of birds of prey be permitted.

The author's concluding paragraph is: "The fact that Ringnecked pheasants and rabbits are more abundant on the area which I have described, than in any equal area with which I am familiar, amply demonstrates that the six species of hawks and owls most abundant on the area, namely, the Red-tailed, Red-shouldered, Rough-legged, Marsh and Sparrow hawks, and the Barn and Short-eared Owls, will pay little attention to anything else, so long as their natural food, the meadow mouse, is abundant and easily obtained."

Food Habits: Marsh hawk

Errington, Paul L., and W. J. Breckenridge. Food habits of marsh hawks in the glaciated prairie region of north-central United States, American Midland Naturalist (University Press, Notre Dame, Ind. Write for price), 7(5), Sept. 1936, pp. 831-848, 4 tables.

Part of authors' summary: "The marsh hawk, in common with most other predators, seems to feed chiefly upon whatever it finds conveniently available as food, whether that food be carrion (of fresher grades) or captured prey. The carrion eaten is represented in large measure by carcasses of animals killed along highways by motor traffic; the prey, by young rabbits, mice, the smaller ground squirrels, passerine birds, and young or crippled individuals of larger species, including ring-necked pheasants.

"From the findings of intensive studies of vertebrate populations, it is becoming increasingly apparent that the role of predation in determining population levels of prey species may be of far less consequence on the whole than has been previously believed. A great deal of the pressure of predators - that of marsh hawks included - seems to be centered upon those proportions of the prey populations that tend to exceed the capacities for accommodation of their respective habitats."

Bibliography of 28 titles.

Food Habits: Rabbit damage

Anon. Rabbit damage in relation to time of planting, Southern Forestry Notes (Southern Forest Expt. Sta., New Orleans, La.), 17, Oct. 1936, pp. [3-4], multigraphed.

Rabbits damage slash, more than long-leaf, pine seedlings; in both cases damage decreases as the planting season progresses. Early planting of slash pine is recommended.

Food Habits: Squirrel, pine

Shaw, William T. Moisture and its relation to the cone-storing habit of the western pine squirrel, Journ. Mammalogy (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(4), Nov. 1936, pp. 337-349, 2 pls.

Store cones in moisture which tightens them and preserves the seeds in good condition. Bibliography of 10 titles.

Food Habits: Squirrel, red, damage to conifers

Anon. Squirrels versus jack pine, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Sept.-Oct. 1936 (December), pp. 2-3.

Squirrels cutting off terminal shoots practically prevented height growth in an experimental stand of 1,000 sixty year-old trees in the Superior National Forest.

Food Habits: Squirrel, red, damage to conifers

Hart, Arthur C. Red squirrel damage to pine and spruce plantations, Journ. Forestry (Society of American Foresters, Mills Bldg., Washington, D. C., 65 cents a copy), 34(7), July 1936, pp. 729-730.

Apparently forced by heavy snowfall that rendered other foods inaccessible, red squirrels fed heavily on buds of conifers in plantations at Storrs, Conn. In one of 10 plantations not a single tree escaped damage.

Food Habits: Weasel

Errington, Paul L. Food habits of a weasel family, Journ. Mammalogy (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(4), Nov. 1936, pp. 406-407.

Analyses of feces from a den near Ruthven, Iowa, revealed, by bulk, 3 percent remains of birds, 4 percent of insects, 56 percent of mammals. The birds were red-winged blackbirds and sparrows; the mammals, striped ground squirrels, rabbits, and mice.

Life Histories: Beaver

Green, H. U. The beaver of the Riding Mountain, Manitoba. An ecological study and commentary, Canadian Field-Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada, 25 cents a copy), 50(1), Jan. 1936, pp. 1-8, 4 photos; (2), Feb. 1936, pp. 21-23; (3), March 1936, pp. 36-50, 9 photos; (4), April 1936, pp. 61-67, 3 photos; (5),May 1936, pp. 85-92, 1 photo.

Based on 3 seasons' field work in the Riding Mountain National Park, this report sets forth the general conditions of the environment and the history of the beaver there, which is one of continued destruction. "The hill billy type of settler with no ideas of conservation or of the aesthetic value of wild life is still responsible for the beaver's destruction as in the early days of settlement." The article gives weights, measurements, and anatomical descriptions; discusses the habits as to walking, swimming, diving, voice, and other means of communication, times of activity, feeding habits and food supply, lumbering and associated activities, and the construction of dams, lodges, and dens; gives information on the number of young, the migration of yearlings, "sign" of all kinds, parasites, and enemies. Poaching is the greatest threat to existence of the species in the region of the study. Constructive suggestions are given for restoration and management. The paper is of much value as a record of original field observations and is written from a wholesome conservation point of view.

Life Histories: Cottontail

Hendrickson, George O. Summer studies on the cottontail rabbit (Sylvilagus floridanus mearnsi (Allen)), Iowa State Coll. Journ. Sci. (Ames, Iowa), 10(4), July 1936, pp. 367-371.

Nine adult and 4 young were found on 15.5 acres, a density of one rabbit to 1.1 acres. Use of pellet counts to determine numbers, territories, and feeding ranges. The average number of rods from cover to the limit of territory in three tracts varied from 5.7 to 17.6 rods. Bibliography of 5 titles.

Life Histories: Double-crested cormorant

Mendall, Howard L. The home-life and economic status of the double-crested cormorant, Phalacrocorax auritus auritus (Lesson), The Maine Bulletin (University of Maine, Orono, Me.), 39(3), Oct. 1936, 159 pp., 12 pls., 1 map, 6 tables.

A very thorough report based chiefly on studies in Maine but also supplementing in some general aspects Harrison F. Lewis's comprehensive work of 1929. The disappearance and reappearance of this cormorant as a breeding species in New England is discussed, and an account given of its known distribution and migrations. The life-history studies cover all activities observable in Maine; these are treated in detail in chapters and generalized in a summary and in a statement of the ecology of the bird. As to economic status, information concerning which was gleaned from all sources, the conclusion is that the cormorant "is fully deserving of our protection, and that, except in scattered, local instances, it is largely neutral if not actually beneficial in its relationship to man." The bibliography comprises 106 titles.

Life Histories: Muskrat

Warwick, Tom. Methods of detecting muskrats, Annals of Applied Biology (Cambridge University Press, Fetter Lane, London, E. C. 4, England), 23(1), Feb. 1936, pp. 165-174, 2 figs., 1 table.

The observations made in the British Isles have at least comparative value as applied to the animal in America. Features of muskrat economy considered are houses, push-ups, plugs, food-traces, burrows, footprints, and dung.

Life Histories: Pheasant ovipositing in nests of other birds

Bennett, Logan J. The ring-necked pheasant as a nesting parasite of other game birds, Iowa State Coll. Journ. Sci. (Ames, Iowa), 10(4), July 1936, pp. 373-375.

Author's summary: "1. Approximately 4.7 per cent of the Puddle Duck nests in the prairie area of Iowa are parasitized by the Ring-necked Pheasant; 2. apparently pheasant eggs deposited in duck nests reduce the potential number of duck eggs; 3. a small percentage of pheasant eggs deposited in duck nests hatch; 4. there is no apparent strife between nesting ducks and nesting pheasants; 5. a small percentage of King Rail nests, Virginia Rail nests, and European Partridge nests are parasitized by pheasants."

Life Histories: Raccoon

Hamilton, W. J., Jr. The food and breeding habits of the raccoon, Ohio Journ. Sci. (Ohio State University, Columbus, Ohio, 50 cents a copy), 36(3), May 1936, pp. 131-140, 1 pl., 1 chart.

Previous reports on the food of raccoons are reviewed and the results given of analyses of 127 stomachs taken in fall and winter in New York. Discussion is given of the principal items or groups of items constituting the food, of which those leading in frequency are buckwheat, apples, beechnuts, wild fruits and berries, corn, earthworms, mice and shrews, and insects. The normal period of gestation is 63 days. Stages in the growth of the young are described and illustrated. The number of raccoons annually taken in the United States "may well exceed the million mark." Recommendations for conservation of the species are made.

Life Histories: Ring-billed gull

Munro, J. A. A study of the ring-billed gull in Alberta, Wilson Bul. (Sioux City, Iowa, 50 cents a copy), 48(3), Sept. 1936, pp. 169-180, 2 pls., 1 table.

Descriptive notes on behavior, nests, eggs, young, casualties, enemies, food, and relation to other species.

Author's summary: "A nesting colony of Ring-billed Gulls together with a few California Gulls situated on an island in Bittern Lake, Alberta, maintained a population of approximately 800 pairs during the nesting seasons of 1932, 1933, and 1934. A study of food remains on the island indicated a diet, for the months of May and June, of grain, ground squirrels, carrion, ground beetles, and mice, named in the order of their importance. Evidence of ducks' eggs being eaten was detected in one instance. Eggs, most of them unconcealed, in an adjacent colony of Avocets were not destroyed by gulls. A brood of four newly-hatched Canada Geese were eaten. The data obtained are insufficient for definite conclusions regarding the local food habits of the species but are of sufficient interest to suggest that a detailed study is desirable."

Life Histories: Robin

Hamilton, W. J., Jr. Notes on nestling robins, Wilson Bul. (Dr. T. C. Stephens, Sioux City, Iowa, 50 cents a copy), 47(2), June 1935, pp. 109-111.

Data from 4 sets of robin nestlings observed and weighed at Ithaca, N. Y., are summarized as follows: "Newly hatched robins average 6.6 grams. At fourteen days, when leaving the nest, they weigh 56 grams. This is an increase amounting to more than eight times the original weight. x x x Robins feed their young, apparently regardless if there be three or five, approximately 3.2 pounds of food during the two weeks while in the nest."

Life Histories: Sex ratio in white-tailed deer

Gerstell, Richard. Sex ratio of whitetail deer progeny, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 7(5), Aug. 1936, pp. 6-9, 3 photos, 3 figs., 1 map.

The effect of "buck laws" has been to unbalance sex ratios. The ratio in fawns picked up at random over a period of 5 years was approximately one to one. That for over 11,000 deer of the year killed in a special season on unantlered deer in 1935 was approximately 2 females to each male. Coordinating the findings with data on overbrowsing previously obtained, it was found "that the fawn crop produced on the over-browsed portions of the Pennsylvania deer range showed a sex ratio wherein the female individuals outnumbered the male individuals by more than 2 to 1, while on the less heavily browsed portions of the range, the ratio never equaled or exceeded a 2 to 1 ratio in favor of the females." The author, therefore, concludes that "the poorer the food conditions the greater the tendency toward the production of females."

Abstracter's comment: The finding last quoted is contrary to those in other fields of biology where the production of females has been found to be favored by good, that of males by poor, nutritive conditions. The secret of the unbalanced ratios may be in a differential mortality in the sexes in early life, a phenomenon known in other animals, including man. The possibility of such a differential mortality indicates that the author's search for evidence as to the sex ratio in a normal deer herd in that of the fawns at birth may be illusory.

Management: Burning

Loffler, Ross L. Fire prevention and its relation to wildlife, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 7(6), Sept. 1936, pp. 4-5, 3 photos.

Forest fires destroy wildlife, are often caused by carelessness, and should be prevented so far as possible. This is an account that is in some respects inaccurate and which ignores the subject of controlled burning. Sweeping, devastating fires admittedly are calamities but fire properly used may be a most valuable tool in wildlife management. The silence and lack of life the author notes as characteristic of a recently burned-over tract is a temporary phenomenon. The area is soon reoccupied and for a period of years when ground cover is luxuriant will support more wildlife than an equal-sized tract of forest. The fact is ignored that unchecked forest growth, from the time of closure of the crown until partial opening of it again due to senility of the trees, smothers out food and cover plants, hence is detrimental to wildlife.

Management: Coon Valley S. C. S. Demonstration

Davis, Kenneth. Protecting fin, fur, and feather in Coon Valley, Soil Conservation (Superintendent of Documents, Washington, D. C., 10 cents a copy, stamps not accepted), 2(6), Dec. 1936, pp. 109-113, 6 photos.

In this valley one of the most seriously eroded agricultural sections of Wisconsin, more than 400 farmers signed contracts to cooperate with the Government for a 5-year period in controlling erosion on their farms. Erosion control practices of benefit to wildlife were made a feature of the work from the beginning. Revegetation of stream banks, gullied areas, and hillsides has improved cover facilities, and 312 food patches were planted on the edges of wooded areas. 161 feeding stations were operated during the first two winters but were discontinued the third, as natural food conditions in the valley had greatly improved. All of the work has been experimental in type so as to develop the best procedure along each line of endeavor. Figures are given for planting and stocking operations. The farmers seem definitely interested and it is felt that a good demonstration is being given of the desirability of making conservative, rather than exploitive, use of the land.

Management: Farm game

Darling, J. N., H. P. Sheldon, and Ira N. Gabrielson. Game management on the farm, U. S. Dept. Agr. Farmers' Bul. (Superintendent of Documents, Washington, D. C., 5 cents a copy, stamps not accepted) 1759, 22 pp., 14 figs., October 1936 (December).

With emphasis on the possibility of returns to landholders and on the practicability of solving farmer-sportsman problems, this bulletin asserts that game management is not a complicated practice and advises making game management fit the land. Suggestions are given for management of cover and food supplies and readers referred for further details to Farmers' Bulletin 1719, "Improving the Farm Environment for Wildlife." On the last page of the publication is a list of the Wildlife Research and Demonstration Units and a directory of State game agencies.

Management: Farm game

Mershon, Ralph. Wild life, a new farm crop, Southern Agriculturist (Nashville, Tenn., no price quoted), 66(10), Oct. 1936, pp. 6, 27, illus.

Discussion of the opportunity of combining soil-building policies of the Agricultural Adjustment Administration, erosion control practices urged by the Soil Conservation Service, and wildlife management recommended by the Biological Survey, to the advantage of wildlife, and profit to the farmer.

Management: Farm game, in Silesia

Leopold, Aldo. Farm game management in Silesia, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(5), Sept.-Oct. 1936, pp. 67-68, 74-76, 8 photos, 2 figs., 2 tables.

This and other articles resulting from the author's European tour give the American sportsman and wildlife manager much needed accurate information on game conditions and game management abroad. The Silesian country described

in this contribution is intensively farmed. Keeping game on it depends chiefly upon the maintenance of artificial coverts known as remises. These average about 2 acres in size; their structure and use in hunting operations are described. Feed patches of corn and Jerusalem artichoke usually are adjacent. Special coverts are provided for partridges and winter feeding of all game is practiced. Crops furnish the chief nesting cover and special methods are used to prevent birds nesting in those that are cut during the nesting period. Information is given on hunting methods, representative bags, and "vermin" control. Pheasants, partridges, hares, and roe deer are the principal game species. Success of the system depends mainly on the landowners' enthusiasm for it. "In no case does government raise game for the shiftless community."

Management: Feeding stations

LeCompte, E. Lee. Feed the birds, Maryland Conservationist (512 Munsey Bldg., Baltimore, Md., 25 cents a copy), 13(4), 1936, pp. 13, 16, 1 photo.

Suggestions for winter feeding of both small birds and game birds.

Management: General statement

Hicks, Lawrence E. Wildlife resources of Ohio, Division of Conservation (Columbus, Ohio) Bul. 134, 5 pp., mimeographed, 1936.

Value of wildlife to the Nation, to Ohio, and to a single county in the State. Number of species of various groups; need of a wildlife handbook. Annual kill of game and fur species in Ohio.

Management: Herd control

East, Ben. Must they starve?, American Forests (919 Seventeenth St., N. W., Washington, D. C., 35 cents a copy), 42(10), Oct. 1936, pp. 463-465, 483, 6 photos.

Starvation of deer in winter yards in northern Michigan; between 300 and 500 deer died in a single winter in one 4,000-acre swamp. Feeding impracticable, hence herd regulation is necessary. Public sentiment places difficulties in the way of a control program and how to manage the situation is not yet apparent.

Management: Maryland Resettlement Project

Wilson, Kenneth A., and Ernest A. Vaughn. The Resettlement Administration and its wildlife program on the Eastern Shore of Maryland, Maryland Conservationist (512 Munsey Bldg., Baltimore, Md., 25 cents a copy), 13(4), 1936, pp. 1-3, 5 photos.

Report of progress on a Resettlement Administration project. Clearing of drainage ditches in acid areas, plowing land to secure volunteering of food plants, and establishing feed patches all resulted in apparent increases in

wildlife populations. Farmers in general gave good cooperation in the planting of feed patches. Details of this cooperation in the area referred to and in other parts of the State are given in a report by E. Lee LeCompte on pages 19-22.

Management: Multiple use

Taylor, Walter P. The principle of "diversification" in the wildlife field, Science (Lancaster, Pa., 15 cents a copy), 84(2181), Oct. 16, 1936, pp. 350-351.

A plea for multiple, instead of specialized, use of natural resources.

Management: Planting

Hershey, John W. Balancing a wildlife program, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(5), Sept.-Oct. 1936, pp. 71, 78, 2 photos, 1 table.

Advises expenditure of a share of game funds for planting food-producing trees. Persimmon and honey-locust specially annotated. A table lists bushes and trees for wildlife in the Middle South and shows their bearing seasons.

Management: Planting

McAtee, W. L. Groups of plants valuable for wildlife utilization and erosion control, U. S. Dept. Agr. Circ. (Superintendent of Documents, Washington, D. C., 5 cents a copy, stamps not accepted) 412, 11 pp., 7 pls., October 1936 (November).

An expanded, printed, and illustrated version of the material first presented in U. S. Biological Survey, BS Leaflet 19 (see WILDLIFE REVIEW, No. 2, Jan. 1936, p. 21). Lists the genera of plants of most value in supplying cover, browse, herbage, mast, fruit, and seed for wildlife and indicates which of these groups have been recommended for use in erosion control.

Management: Planting

Westveld, R. H., and Rudolf Bennitt. Improving food and cover for wildlife on Missouri farms, Univ. Mo., Agr. Extension Sta. (Columbia, Mo.), Circ. 348, 8 pp., 1 table, July 1936.

"The surest way to restore wildlife is to increase the permanent breeding stock by improving the surroundings in which it lives." The meat of this circular is presented in a tabulation of recommended plants that indicates the soils to which they are suited, their value for food and cover, and their bearing seasons. Suggestions are given also as to the character and handling of planting material and as to maintaining favorable conditions in woodlands.

Management: Planting, seed preparation

Paton, R. R. Preplanting treatment of black cherry seed, Journ. Forestry (Mills Bldg., Washington, D. C., 65 cents a copy), 34(7), July 1936, p. 730.

Plantings made in Ohio from five lots of seeds given different treatments showed that treatment is unnecessary to secure satisfactory germination. If early sprouting is desired, fermenting the seed before sowing is effective.

Management: Planting for waterfowl

Dock, Raymond S. Wild ducks at home, Country Life (444 Madison Ave., New York, N. Y., 50 cents a copy), 70(6), Oct. 1936, pp. 50-53, 10 photos.

American wild fowl have come to the zero hour; hunters have taken their fun with the birds, draining the cup to the dregs; now they had better pay back as best they may. Popular account of the restoration, planting, and success of a small refuge pond in Connecticut. Illustrations of 5 species of waterfowl and 5 duck food plants. One of the latter seems mislabelled Potamogeton natans; rather it appears to be P. americanus.

Management: Planting for wildlife, nuts

Morton, James N. Nut trees: their place in game management, Rep. Proc. 4th Ann. Meeting Penn. Nut Growers Assoc. (J. W. Hershey, Sec'y., Downington, Pa.), January 1936, pp. 19-21, mimeographed; Penn. Dept. Forests and Waters, Service Letter (Harrisburg, Pa.), 7(25), June 18, 1936, pp. 1-2.

Whatever other favorable conditions exist, food and cover are the great essentials for wildlife. Among foods, nuts are of first rate importance. Notes on utilization of the various kinds, including acorns, and their nutritive value. Suggestions as to how nut growers can aid the wildlife manager by producing varieties or hybrid stocks better adapted for various purposes than are existing kinds.

Management: Refuge, cooperative

Conklin, W. Gord. Cooperative farm refuge, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 7(6), Sept. 1936, pp. 6-7, 4 illus., map on p. 27.

Statement of a project covering ten connecting farms totalling 1,507 acres (200 set aside for refuges) and the hopes that are entertained for its success. Copy of the agreement between the Board of Game Commissioners and the landholders.

Management: Stocking, chukar partridge

Anon. Chukar partridge now success in State, California Conservationist (303 State Office Bldg., Sacramento, Calif., 15 cents a copy), 1 (11), Nov. 1936, pp. 10-11, 2 photos.

Notes on range and habits of the species in Eurasia; 3,505 birds have been liberated in 26 counties since 1932; in a few localities definite evidence of breeding and increase has been obtained; the "situation looks promising."

Management: Stocking, elk

Gerstell, Richard. The elk in Pennsylvania: its extermination and reintroduction, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(7), Oct. 1936, pp. 6-7, 26, 2 photos, 1 graph, 1 map.

The elk, originally numerous, was exterminated in 1867. Reintroduced in 1913 and 1915, the animals increased despite some poaching and killing to protect crops, so that an open season was allowed annually from 1923 to 1931, inclusive. The total number of animals legally killed - 177 - was about the same as that introduced. While some stock remains, the experiment seems doomed to failure because the opening up of wilderness areas has decreased the suitability of the habitat and made the animals readily accessible to hunters.

Management: Stocking, mallard

Errington, Paul L., and W. E. Albert, Jr. Banding studies of semi-domesticated mallard ducks, Bird Banding (Charles B. Floyd, 95 South St., Boston, Mass., 50 cents a copy), 7(2), April 1936, pp. 69-73, 4 tables.

Of 350 Iowa game farm mallards traced by trapping and banding operations continued through three years, only 3 are known to have been killed by hunters, and those locally. The results confirm Lincoln's conclusions (Yearbook U. S. Dept. Agr., 1934, pp. 310-313) from observations on Long Island, N. Y., birds, namely, that hand-reared mallards do not join wild flocks and that their use so far as known is not effective in restocking operations.

Management: Stocking, quail

Errington, Paul L. Restocking quail in our northern States, Minnesota Conservationist (State Office Bldg., St. Paul, Minn., 15 cents a copy), Sept.-Oct. 1936, pp. 10-11, 15, 1 photo.

Carrying capacity under the very best conditions is about a bird per acre; a carrying capacity of a bird to 2 acres is excellent, and of one bird to 4 to 6 acres is good. The great regulator of populations in the north is the winter carrying capacity and only about so many birds survive in a given territory "regardless of how open the winters may be and regardless of the kinds and numbers of enemies present." Environmental improvement rather than

restocking usually is the best remedy for a quail shortage. When restocking must be undertaken, the birds used should be of the adapted strain and, so far as can be, assured sound in every respect.

Predation

Wing, Leonard. Predation is not what it seems, Bird-Lore (1775 Broadway, New York, N. Y., 30 cents a copy), 38(6), Nov.-Dec. 1936, pp. 401-405, 5 photos.

Notable losses from predation indicate that the environment is lacking in some feature necessary to adequate accommodation of the prey. Management implies removal of excess population and if it is not removed by man, predators should not be condemned for utilizing it. Argument exemplified by the history of deer that were fenced out of their wintering "yard", weakened by starvation, and then eaten by wolves.

Propagation: Jungle fowl

Bloodgood, Paul R. The red junglefowl, Modern Game Breeding and Hunting Club News (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa., 25 cents a copy), 6(12), Dec. 1936, pp. 4-5, 2 photos.

Description; instructions as to care and use as foster mothers for which they are recommended.

ADDENDA

Classification

Klauber, Laurence M. A key to the rattlesnakes, with summary of characteristics, Trans. San Diego Soc. Nat. Hist. (Natural History Museum, Balboa Park, San Diego, Calif.), 8(20), pp. 185-276, figs. 1-112, Dec. 1936.

General discussion of the family Crotalidae, check-list of and key to the species and subspecies of Crotalus and Sistrurus; synonymy; summary of rattlesnake life history; notes on control and enemies, commercial value, the venom apparatus and treatment of snake-bite. With profuse illustration, including distribution maps.

Conservation

Parkins, A. E., and J. R. Whitaker, editors. Our natural resources and their conservation (John Wiley & Sons, Inc., 440 - 4th Ave., New York, N. Y., $4.00 a copy), 650 pp., many illus., 1936.

Probably the entire content of this volume will prove of interest to readers of WILDLIFE REVIEW, but Chapter 19, Conservation of Wildlife (pp. 485-526, 7 figs., by V. E. Shelford), and Chapter 20, Recreational Resources (pp. 527-557, 1 fig., by Edward C. Prophet), no doubt will have special appeal.

From the nature of the case, Shelford's account is more or less pessimistic. As an ecologist he makes the point that primeval biotic communities, which the nation has so freely destroyed, are not renewable resources. If any of those left are to be conserved they must be preserved and that on a hands-off basis. The effect of public opinion and action, especially through public agencies, upon American wildlife is described, and drainage, pollution, and politics receive about equal attention. An outline is given of the present condition of wildlife in national parks and other complete sanctuaries, in large forest and game preserves, public lands, grazing lands, and on farms. Reference is made to extinct, vanishing, and endangered species, introduced animals, and "vermin". The objects of preservation-conservation are defined, a system of buffer zoning to give partial protection to wide-ranging species is suggested, and the desirability of using the scientific method of check areas in wildlife management is emphasized. The requirements of restoration are rather fully treated. "The most fundamental requirement of wildlife preservation and conservation is control of the land on which the animals are found."

In the Chapter on Recreational Resources, by Prophet, wildlife is given due, but not conspicuous, attention. Hunting and fishing lands are classified and discussed under the divisions, private, government, and uncontested trespass, lands. "Uncontested trespass is rapidly becoming a thing of the past. If the American public is to have ready access to hunting land, then public agencies must acquire far more land than they now control in order to provide for the demand." Esthetic uses of land are not neglected and they are defined as use "by the sightseer who enjoys the beauties of the landscape but who does not tamper with or destroy the resource." Much damage has been caused "by mismanagement or utter failure to manage land" for recreational purposes, but in the last twenty years great progress has been made and the outlook is encouraging.

As an appendix to Chapter 19, there is a bibliography of 28 titles on pages 631-632, and to Chapter 20, one of 11 titles on pages 632-633.

Ecology: Dependence of wildlife upon vegetation

Osborn, Ben, and H. L. Whitaker. Significance of natural vegetation in planning erosion control and wildlife management, Soil Conservation (Superintendent of Documents, Washington, D. C., 10 cents a copy, stamps not accepted), 2(6), Dec. 1936, pp. 126-129, 4 photos.

All said about wildlife is here quoted: "Wildlife conservation, along with soil conservation, must deal with the vegetative cover of the earth. This cover is the home of wildlife species. It is both their shelter and their food. Each kind of animal has its own special requirements and lives in the particular type of vegetation which most nearly suits these needs. Within its range, the average population of a species rises and falls as the condition and quality of the vegetative cover does or does not favor its own particular requirements. If man undertakes to manage and control wildlife populations, it is plain that he must work through vegetation. The plant species, either separately or in their natural associations are the materials which he must use. These species

and associations, however, cannot be shifted indiscriminately about the face of the earth. Each must be manipulated in its own natural environment. The natural vegetative pattern, therefore, constitutes the framework for the wildlife manager's program and tells him what are the possibilities in any particular area."

WILDLIFE RESEARCH AND MANAGEMENT LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Biological Survey, U. S. Department of Agriculture, Washington, D. C.

BS-59. Directions for organizing and conducting rabbit drives, June 1936, 2 pp., 1 diagram.

Cost of destruction in well conducted drives not more than 2 cents per animal. Suggestions as to construction of corrals and management of drives.

BS-61. Sullys Hill National Game Preserve, North Dakota, by Clara Ruth, July 1936, 5 pp., 6 photos.

Location, history, purpose, description; list of Federal big-game preserves.

BS-62. Suggestions on trapping coyotes and wolves in Alaska, by Harlan H. Gubser, August 1936, 6 pp.

Increase and spread of coyote in Alaska; need of control. equipment and directions for trapping; den hunting.

BS-64. Protecting crops from damage by horned larks in California, by Johnson A. Neff, September 1936, 10 pp., 1 diagram.

Nature and extent of damage and outline of methods used to control it.

BS-67. Wildlife technology, by W. L. McAtee, October 1936, 5.pp.

Origin and present status; identity, range, migration, food, and cover techniques; wildlife technology in conservation.

BS-70. Poisonous snakes of the United States, November 1936, 19 pp.

Key to the principal species; poison apparatus and venom; mortality from snakebite; treatment; miscellaneous "snake stories". Bibliography of 45 titles.

BS-71. Wildlife in land planning, by W. L. McAtee, November 1936, 6 pp.

Value of wildlife; results of unfavorable and favorable alterations in environment; allotment of land to wildlife; management in relation to land use; value of wildlife management.

BIOLOGICAL BIBLIOGRAPHIES

American periodicals relating to birds

[Supplement; previous installment in WILDLIFE REVIEW No. 4, pp. 27-29.]

Bird Calendar. Quarterly, mimeographed, 50 cents a year. Cleveland Bird Club, 1505 Rydalmount Road, Cleveland Heights, Ohio.

Bird Notes. Annually, 15 cents a copy. Prof. T. J. McCarthy, State Teachers College, Superior, Wis.

The Chickadee. Semi-annually, $1.00 a year, single copy 50 cents. Forbush Bird Club, 12 State St., Worcester, Mass.

Journal of Minnesota Ornithology. Annually, 50 cents a year. T. S. Roberts Ornithology Club, State Teachers College, St. Cloud, Minn.

Nature Notes of the Webster Groves Nature Study Society. Monthly, mimeographed, 50 cents a year. Mrs. Frederick E. Pfeiffer, 4643 Seibert Ave., St. Louis, Mo.

The Night Heron. Quarterly, $1.00 a year, single copy 25 cents. 1014 Price Road, Clayton, Mo.

The Old Field Lark. Monthly, mimeographed, 75 cents a year, single copy 10 cents. 12910 South Mozart St., Blue Island, Ill.

St. Louis Bird Club Bulletin. Issued 10 times a year, mimeographed, 50 cents a year. 3006 Elliot Ave., St. Louis, Mo.

The Snowy Egret. Semi-annually, mimeographed, $1.00 a year. Pippapass, Ky.

Sporting magazines and conservation department organs

[Supplement; previous installments in WILDLIFE REVIEW, No. 3, pp. 32-34, and No. 4, p. 27.]

Of general scope

Fishing and Hunting Review. Semi-monthly, $1.00 a year, mimeographed. Sports Bulletin Publishing Co., 36 West 44th St., New York, N. Y.

Of local scope

Conservation. Bi-weekly. Iowa State Conservation Commission, Des Moines, Iowa. (A mimeographed clip-sheet.)

Official News Bulletin. Published at irregular intervals. Department of Conservation, Lansing, Mich. (A mimeographed clip-sheet.)

Conservation News. Monthly? No price quoted. Mississippi Game and Fish Commission, Jackson, Miss. Mimeographed.

Montana Fish and Game Notes. Monthly, no price quoted. Montana Fish and Game Commission, Helena, Mont.

Texas Wild Life. Monthly, $1.50 a year. Texas Wild Life Federation, Austin, Tex.

NOTES AND NEWS

I. T. Bode has been appointed wildlife specialist in the Extension Service, U. S. Department of Agriculture, and will cooperate with the Biological Survey and State Extension Services in making available to the States information on wildlife developed by the Survey. The cooperative wildlife research, demonstration, and educational projects that have been supervised by Mr. Bode will be cared for by Dr. H. H. T. Jackson.

The Biological Survey reports that fifty-seven small refuges for migratory waterfowl and water conservation have been established in North Dakota during the past year on more than 90,000 acres of land turned over to the Government through perpetual easements signed by farmers and other landowners.

Five inexpensive and widely applicable measures which conserve the soil and at the same time preserve wildlife, have been tested recently near Harwood, Md., by the Soil Conservation Service. Ernest G. Holt, in charge of wildlife work, says the methods are generally adaptable to all agricultural sections of the country and are particularly successful in preserving such wildlife as rabbits and quail.

The five measures, in general, make use of resources readily available on the average farm, and one or more of the methods will help preserve wildlife on farms in every part of the country, Holt says. The tested measures include:

(1) The planting of mixed grains in protected areas where winter food for game and birds is lacking. These plantings, while helping to control soil erosion, can be easily accessible to wildlife, yet can be placed where they will not interfere with the cropping system.

(2) Soil-binding trees, shrubs, or cover crops are used by farmers to reclaim gullied land and check gully spread. It is an easy matter to include in the erosion-control plantings some shrubs or plants which furnish food for wildlife. There are many such plants, but some of the more widely used are: lespedeza, coralberry, toyon (an evergreen shrub sometimes known as the California holly), blackberry, dogwoods, and viburnums.

(3) Fencing of farm woodlands for protection from grazing also helps to conserve wildlife. Protecting woodland areas from farm livestock permits the growth of forest trees and shrubs which provide food for wildlife. The combi-

nation planting of trees and food-producing shrubs not only supplies food for small game and birds, but also may add to the quality of a forest stand and contributes materially to erosion control. Many farm woodlands are not grazed, but are still in need of stand improvement. In these cases, the Service recommends planting the kinds of trees and shrubs which improve the quality of the stand and which, at the same time, add to the effectiveness of the soil-saving program. Wildlife should not be forgotten when such plantings are made. Open spaces may be purposely left in the woods and allowed to grow to briars and shrubs, in order to supply food for small game and birds.

(4) Whenever it is necessary to clean brush or hedgerows for fencing or woodland improvements, the brush piles may be left as cover for birds, rabbits, and other wildlife. Tree tops and brush neatly piled and left on the ground through the winter furnish welcome cover and shelter for birds and small game. In woodland cuttings, a few snags may be left to provide nesting places for nuthatches, chickadees, flickers, woodpeckers and other birds valuable to the farmer.

(5) In farm woodlands of hardwoods, strips and borders of pine and spruce have been planted on many acres this fall. This is particularly true in locust plantations where it is considered that these strips, by shading the trunks of the trees, materially aid in reducing locust borer injury. These strips and borders serve well as wildlife cover areas.

Wherever practical, erosion control workers interested in wildlife also discourage fence-row cleaning, so that vegetative growth along fence rows will be saved for wildlife shelter and food. This practice may find application in many parts of the country, since the activities of birds are likely to more than compensate for any weed or insect pests that may be harbored in fence rows.

The following publication should be called to the attention of wildlife managers: U. S. Department of Agriculture Farmers' Bulletin 1758, Cover crops for soil conservation, by Walter V. Kell and Roland McKee, 14 pp., 11 figs., July (October) 1936. Obtainable from the Superintendent of Documents, Washington, D. C., for 5 cents a copy, stamps not accepted. The principal plants treated are sweetclover, crimson clover, bur-clover, vetches, Austrian winter field peas, kudzu, lespedeza, the cereal grains, redtop and Italian ryegrass.

Announcement has been made by the Post Office Department in Washington, D. C., that rural mail carriers are permitted to assist in feeding birds in snowy weather by distributing grain along their routes whenever they can do so and when grain for the purpose is provided by persons or organizations interested.

A Delaware law provides for payment from a license fee fund for damage done by dogs. In one year, 110 complainants were reimbursed to the extent of $1,435. In addition, under other provisions of the law, 39 claims were settled to the satisfaction of farmers by the owners of dogs that had killed 856 chickens, 90 turkeys, 27 ducks, 6 geese, 10 sheep, and 2 pigs. (Delaware Sportsman, 2(2), October 1936, pp. 5, 11.)

A result of the recent election of interest to readers of WILDLIFE REVIEW was the adoption by Missouri of an amendment to the State Constitution providing for a non-partisan conservation commission. The proposal was adopted by a 3 to 1 majority.

The establishment of a series of fellowships at selected universities, it is announced, will feature the 1937 program of the National Association of Audubon Societies. The Association proposes to contribute $1,500 to cover compensation to the student plus travel expenses, the university to put up the equivalent of $1,000 to $1,500 in services and equipment. The subjects of research to be proposed by the Association will be in the field of natural history as bearing on conservation problems. The first fellowship to be announced is at the University of Arizona for a life history study of the Desert Mountain Sheep.

Fishing and Hunting Review (36 West 44th St., New York, N. Y.) introduces itself as a semi-monthly bulletin service distributing in mimeographed form news items relating exclusively to hunting and fishing. This material is gleaned from 2,000 daily papers and from other sources and is sent to subscribers for $1.00 a year.

By courtesy of the Consular Service, we have seen translations of German ordinances (of 1935) relating to the protection of nature. They are far-reaching and show what can be done where there is great centralized power. In the preface to the general law we are informed that, "The German Government considers it to be its duty to assure even to its poorest citizens their portion of German natural beauties." The ordinances provide for Natural Monuments which are creations of Nature, the preservation of which is in the public interest, and nature reserves or strictly delimited areas in which a special protection of nature is for the public welfare; these may be on either private or public land; there are also preserved regions belonging to the nation or states, that are of major size and importance for nature protection. Administration is by the German Forester General through subordinate officials and committees and there is also a "consultative" service for the detection, scientific investigation, permanent conservation, and supervision of the nature areas, and for promoting a general understanding of the ideals of nature

protection. Land areas which are surrounded by, or border, National Nature Preserves may be expropriated if required. Protection is provided for the environs of reserved areas against the erection of shops, the location of tents, benches, signs, deposition of refuse and other things that might injure their appearance or interfere with their usefulness. Regulations for the protection of plants and non-game animals provide for the destruction of injurious, as well as for the safeguarding of useful, species. The provisions affecting plants are more thoroughgoing than we are accustomed to in the United States. There are lists of wholly protected and partially protected species, and meticulous regulations relating to collecting, sale, or use for industrial purposes. Centuries-old practices in liming, snaring, and trapping birds are prohibited, and the cage-bird business is explicitly defined and restricted. Unprotected species comprise crows, jay, magpie, and the house and tree sparrows (the last two species are the same that have been introduced into the United States), but even in these cases a considerable list of "unfair" means of taking are forbidden. Provision is made for the legal disposal of stray cats at the cost of their owners.

Normally ringneck pheasants are diggers rather than scratchers and it is that propensity which results in damage to beets, carrots, and other root crops including even potatoes. W. J. S. Walker of Calgary, Alberta, informs us that the digging habit was overcome in pen-raised birds by keeping them in coops with bantams and always scattering their feed in a mulch. The pheasant chicks soon learned about scratching from their foster mothers and when released continued to scratch and did not dig.

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